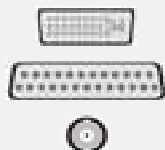




	GV-998	GV-898+ / 798+	GV-698+	GV-198	GV-242	GV-241
OUTPUTS						
RGB	BNC/SCART	BNC/SCART	BNC/SCART	SCART	DVI	BNC/D25/D15/D9
S-VHS	✓	✓	✓	-	✓	-
SCART	✓	✓	✓	✓	-	-
YPbPr	BNC/SCART	BNC/SCART	BNC/SCART	-	DVI	-
Sync	BNC	BNC	BNC	✓	-	BNC/D15/D9
Blackburst	BNC	BNC	-	-	-	-
TS MPEG-2 SPI	D25	-	-	-	-	-
TS MPEG-2 ASI	BNC	-	-	-	-	-
HDTV	-	-	-	-	✓	-
Composite Video	✓	✓	✓	✓	✓	✓
Computer Monitors	-	-	-	-	-	✓
REFERENCE PATTERNS						
4:3	✓	✓	✓	✓	✓	-
16:9	✓	✓	✓	✓	-	-
Patterns	37	37	23	9	20	8
TV SYSTEMS						
PAL	✓	✓	✓	✓	✓	-
NTSC	✓	✓	✓	✓	✓	-
SECAM	✓	✓	✓	✓	-	-
RF SOUND	Mono, dual/stereo (Zweiton or NICAM)	Mono, dual/stereo (Zweiton or NICAM)	Mono, dual/stereo (Zweiton or NICAM)	Mono	Mono, stereo Baseband Sound	-
RF OUTPUT	VSB	VSB (GV-898+) DSB (GV-798+)	DSB	DSB	-	-
LOGOS	✓	✓	✓	-	-	-
TELETEXT	✓	✓	✓	-	-	-

Interconnection elements description



DVI connector (*Digital Video Interface*)



SPI connector (*Synchronous Parallel Interface*), D25



ASI connector (*Asynchronous Serial Interface*), BNC



D15 connector, 15 pin



D9 connector, 9 pin

Signals description



VSB signal (*Vestigial Side Band*)

DSB signal (*Double Side Band*)



Breakthrough generators: an instrument for every budget

TV GENERATORS

GV-998	.4
GV-898+ / 798+	.6
GV-698+	.8
GV-198	.10

GENERATORS FOR MONITORS & MULTIMEDIA

GV-242	.12
GV-241	.14



Training centres

With more than 40 years of experience in the instrumentation field, leading the design and distribution of television test systems, **PROMAX** introduces this new catalogue of signal generators for TV sets and monitors.

In this catalogue you will find a wide range of easy to use instruments, which fit every budget while meeting most of your technical requirements; they support all types of monitors and TV sets, including flat, big screen units, projectors, etc.

All instruments are multi-standard and multi-system; they can be used for lab applications, production lines, field service or training centres.



Production lines



Hi-Fi & Home-Cinema

Analogue and Digital TV Generator



- Test Signal generation in MPEG-2, SPI or ASI format
- The Test Signal contains valid audio and video programs
- External analogue and digital audio / video inputs
- Moving MPEG-2 video pattern generation
- MPEG logos
- RS-232 remote operation
- Multi-standard and multi-system analogue TV signals

The **GV-998** is an **analogue** and **digital TV signal generator**. In analogue mode, it's a very flexible multi-standard, multi-system instrument with the same performance as the **GV-898+**. In digital mode, thanks to its **TS outputs** (Transport Stream) in **MPEG-2** format, is perfect for manufacturing, verifying and maintaining all kinds of digital TV receivers.

The instrument's output signal meets the DVB (**DVB-PI**) specifications and can be applied to **QAM**, **QPSK** and **COFDM** digital modulators.

The system has **external audio / video analogue inputs**. These are converted to CCIR 656 and I2S format and multiplexed with standard patterns; they are then applied to the MPEG-2 encoder to generate the TS output. The instrument is microprocessor controlled, handling both the user interface and internal circuitry. Among other features, it's capable of altering the transmitted data stream format and can be controlled with a personal computer.

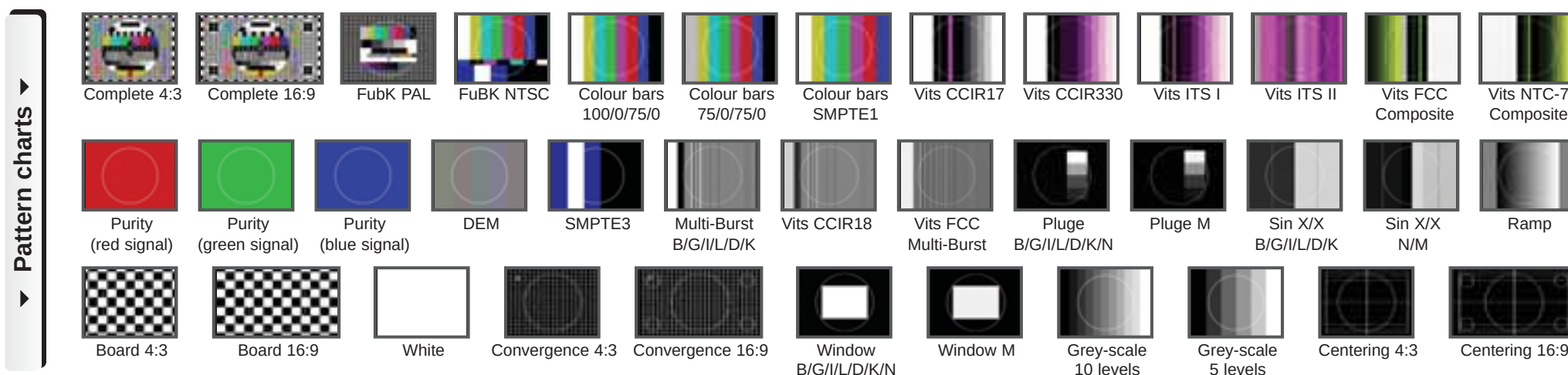
▼ 37 Charts ▼

Programmable
TS bitrate
4:3 and 16:9 formats
Electronic circle
for all patterns
MPEG-2 logos

▼ Outputs ▼

RF
YPbPr
TS MPEG-2
RGB
S-VHS
SCART
Sync
Blackburst
Composite video

With MPEG-2 TS Output



SPECIFICATIONS	GV - 998		Teletext	Index page and 4 data pages in 4 different languages
System & Standard	PAL B/G/D/K/I/M/N, SECAM B/G/D/K/L, NTSC M		Colour Logotypes	2 independent, positionable logos; analogical & MPEG
Video Carrier	50 kHz		Audio	AM-FM-NICAM modulation
Resolution	By channels or by frequency (CCIR, STDL, OIRT, FCC)		Mono	B, G, D, K, M systems
Tuning			Dual-Stereo Zweiton	B, G, L, I, D, K systems
Pattern charts	37		Dual-Stereo NICAM	
Front panel outputs			Inputs	Video & Audio
	RF		PDC (<i>Program Delivery Control</i>)	
	Output level	80 dBμV, attenuation up to 60 dB in 1 dB steps	Systems	PAL B/G/I/D/K, ON/OFF selectable
	Frequency range	35 to 900 MHz VSB modulated	Content	Selectable START, STOP and PAUSE; time, country
	MPEG-2		VPS	
	Outputs		Systems	PAL B/G/D/K selectable ON/OFF
	Bitrate		Content	Selectable START, STOP and PAUSE; time, country
	Video		WSS (<i>Wide Screen Signaling</i>)	
Audio		Systems	PAL B/G/I/D/K	
Composite video	BNC connector, 1 Vpp voltage, 75 Ω impedance		Country	Eight combinations for 4:3,14:9 and 16:9 formats
Rear panel outputs			Power supply	
	Blackburst	75 Ω, negative polarity, BNC connector	Mains voltage	110-125-220-230/240 V AC ± 10%, 50-60 Hz
	RGB	75 Ω, 0.7 Vpp amplitude, BNC connector	Consumption	40 W
	YPbPr	0.7 Vpp amplitude, BNC connector		
S-VHS	75 Ω, 1.3 Vpp amplitude (lum.) - 0.3 Vpp (chrom.)			
Synchronisms	CS, horizontal pulse, vertical pulse			
SCART	-		Mechanical features	
			Dimensions	W. 288 x H. 102 x D. 307 mm
			Weight	5.8 kg.

TV Generators



- Vestigial Double Side Band Modulation - VSB (GV-898+ only)
- YPbPr outputs
- External audio / video inputs
- 4:3, 16:9 & 14:9 formats (WWS signals)
- NICAM / Zweiton sound
- VPS & PDC control signals
- RS-232 remote operation
- Multi-standard and multi-system analogue TV signals
- Test signals (VITS)

The **GV-898+** and **GV-798+** are analogue TV generators capable of up to **37 different test patterns** which enable exhaustive diagnostic tests of any TV receiver, video or *Home Theater* system.

In addition to conventional RGB, SCART or S-VHS outputs, **YPbPr** are becoming increasingly popular for large format TFT screens, plasma and TV projectors.

They have **32 memories** to store operating configurations that you want to access quickly.

The only difference between **GV-798+** and **GV-898+** models is the RF modulator. The **GV-798+** uses a double sideband (**DSB**) type while **GV-898+** uses a vestigial sideband (**VSB**) approach, similar to the ones used for TV signals broadcast.

▼ 37 Charts ▼

4:3 & 16:9 formats

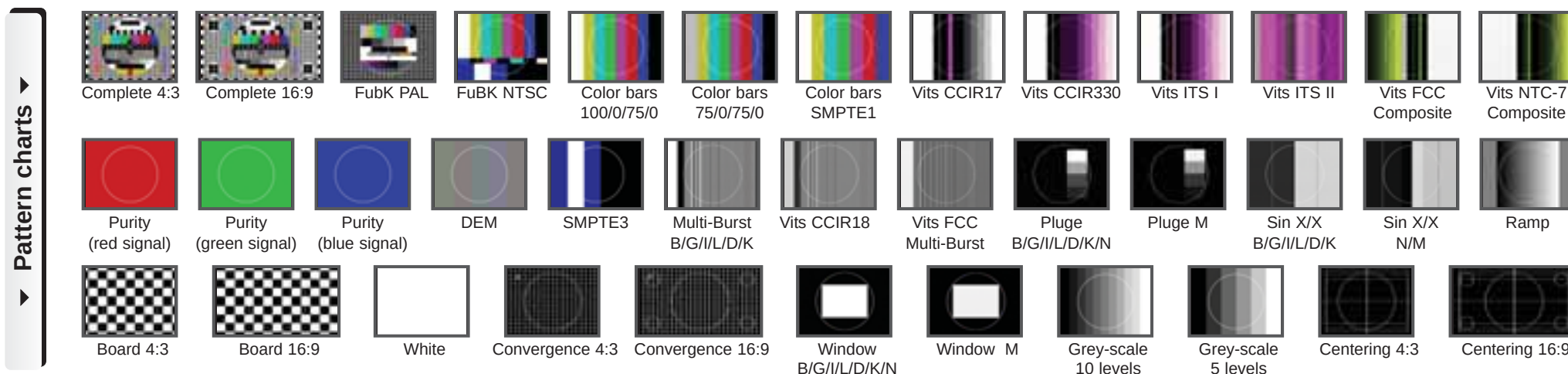
Electronic circle
in all charts

Insertion and
positioning of 2 logos

▼ Outputs ▼

RF
YPbPr
RGB
S-VHS
SCART
Synchronisms
Blackburst
Composit video

High range



SPECIFICATIONS	GV - 898+ / GV - 798+	Colour Logotypes	2 independent, positionable logos
System & Standard	PAL B/G/D/K/I/M/N, SECAM B/G/D/K/L, NTSC M	Teletext	Index page and 4 data pages in 4 different languages
Video carrier Resolution Tuning	50 kHz By channels or by frequency (CCIR, STDL, OIRT, FCC)	Audio Mono Dual-Stereo Zweiton Dual-Stereo NICAM	AM-FM-NICAM modulation B, G, D, K, M systems B, G, L, I, D, K systems
Pattern charts	37	PDC (Program Delivery Control) Systems Content	PAL B/G/I/D/K, ON/OFF selectable Selectable START, STOP and PAUSE; date, time, country
Modulation	Double sideband DSB (GV-798+) Vestigial sideband VSB (GV-898+)	VPS Systems Content	PAL B/G/D/K seleccionable ON/OFF Selectable START, STOP and PAUSE; date, time, country
Front panel outputs RF Output level Frequency range Impedance Composite video	80 / 85 dBμV (GV-898+ / GV-798+), attenuation up to 60 dB in 1 dB steps 37 - 865 MHz (GV-798+) 35 - 900 MHz (GV-898+) 75 Ω 75 Ω, 1 Vpp, positive polarity, DC coupling	WSS (Wide Screen Signaling) Systems Content	PAL B/G/I/D/K Eight combinations for 4:3,14:9 and 16:9 formats
Rear panel outputs Blackburst RGB YPbPr S-VHS Synchronisms SCART	75 Ω, negative polarity, BNC connector 75 Ω, 0.7 Vpp amplitude, BNC connector 0.7 Vpp amplitude, BNC connector 75 Ω, 1.3 Vpp (lum.) amplitude - 0.3 Vpp (crom.) CS, horizontal pulse, vertical pulse	Power supply Mains voltage Consumption Mechanical features Dimensions Weight	110-125-220-230/240 V AC ± 10%, 50-60 Hz 40 W W. 288 x H. 102 x D. 307 mm 5.6 kg. (GV-798+) / 5.8 kg. (GV-898+)

TV Generator



- 4:3 and 16:9 format patterns
- Compatible with PAL, SECAM and NTSC systems
- NICAM and Zweiton Sound
- Addition of an electronic circle on all patterns (except colour bars)
- Two logotypes
- VPS / PDC control signals
- Multi-standard and multi-system analogue TV signals
- RS-232 remote control

The **GV-698+** is a TV pattern generator with excellent price / performance ratio which is specially suitable for service of all kinds of TV receivers.

This pattern generator has the features usually found only in professional units, such the **NICAM** sound or **teletext**, while keeping a very attractive price tag.

There are **32 memories** available to store your most common test configurations. It is also possible to turn ON or OFF the colour burst, the sound subcarrier, the colour subcarrier, etc...

The **GV-698+** also has a DSB modulated RF output, with level adjustable in 10 dB steps.

▼ 23 Patterns ▼

4:3 & 16:9 formats

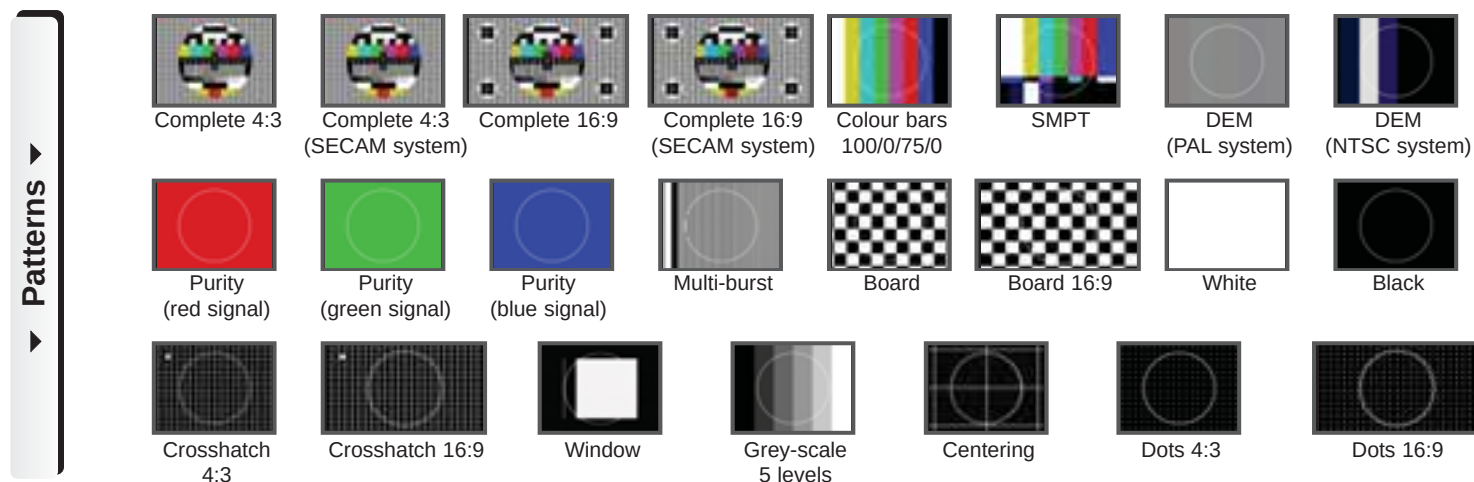
Electronic circle

Pattern icons
on the front panel

▼ Outputs ▼

RF
YPbPr
RGB
S-VHS
SCART
Synchronisms
Blackburst
Composite video

Medium range



SPECIFICATIONS	GV - 698+	RF output	Output amplitude Frequency range Impedance	90 dBμV ±3 dB, attenuation up to 50 dB in steps of 10 dB 37 to 865 MHz 75 Ω
System & Standard	PAL B/G/D/K/I/M/N, SECAM B/G/D/K/L, NTSC M	Modulation		Double side band
Video Carrier Resolution Tuning	Synthesized, 34 - 865 MHz By channels or by frequency (CCIR, STD L, OIRT, FCC)	Logotypes		One or two position-independent logotypes
Patterns	23	Audio Mono Dual-Stereo Zweiton Dual-Stereo NICAM		AM-FM-NICAM modulation B, G, D, K, M systems B, G, L, I, D, K systems
PAL(B,G,H,D,I) colour subcarrier Frequency Burst duration Amplitude / phase error	4.43361875 MHz <± 30 ppm (10°C - 40°C) 2.4 μs (10 ± 1 period of Fsc) ± 5 % / ± 3 %	Rear panel outputs Video RGB - YPbPr S-VHS Synchronisms SCART		75 Ω, positive polarity, BNC connector and SCART 75 Ω, 0.7 Vpp amplitude, BNC connector and SCART 75 Ω, 0.7 amplitude Vpp (lum.) - 0.3 Vpp (crom.) Negative polarity, BNC connector
NTSC (M) colour subcarrier Frequency Burst duration Amplitude error Phase error	3.579545 MHz <± 30 ppm (10°C - 40°C) 2.38 μs (10 ± 1 period of Fsc) ± 5 % ± 3 %	Teletext Transmission mode Content		NRZ (not return to zero) 8 different pages (two languages sent consecutively)
SECAM (B, G, H, D, K, K1, L) colour subcarrier Subcarrier frequency (sync f _{sc}) Dual-Stereo NICAM	For = 4.406250 MHz ± 2 kHz Fob = 4.250000 MHz ± 2 kHz 5.850 - 6.552 MHz, 4QPSK modulation	Power supply Mains voltage / consumption		110-125-220-230/240 V AC ± 10%, 50-60 Hz / 20 W
Inputs Video/Audio	75 Ω (V), 10 kΩ (A) direct coupling, SCART	Mechanical features Dimensions and weight		W. 288 x H. 102 x D. 247 mm / 3 kg.

TV Generator



- Direct access keys for nine different charts
- 4:3 & 16:9 formats
- Addition of an electronic circle
- Economy range
- Double side band modulation
- Tuning by frequency or CCIR / OIRT / FCC channel tables
- Multi-standard and multi-system
- Up to 10 available memories

The **GV-198** video generator is one of the most affordable PAL/SECAM/NTSC units on the market. It has nine different reference patterns that can be accessed with a keystroke; these allow performing the basic adjustments of any receiver as well as detecting malfunctions by visually checking the picture. Patterns can be in **4:3** and **16:9** format.

The synthesized RF modulator covers the **37-865 MHz range**; tuning can be handled by CCIR, OIRT or FCC channels or directly by frequency, in 50 KHz steps. An electronic attenuator allows a maximum attenuation of 50 dB in 10 dB steps.

The **GV-198** has 10 memories for storing 10 different, direct-access test configurations

▼ 9 Charts ▼

4:3 and 16:9 formats

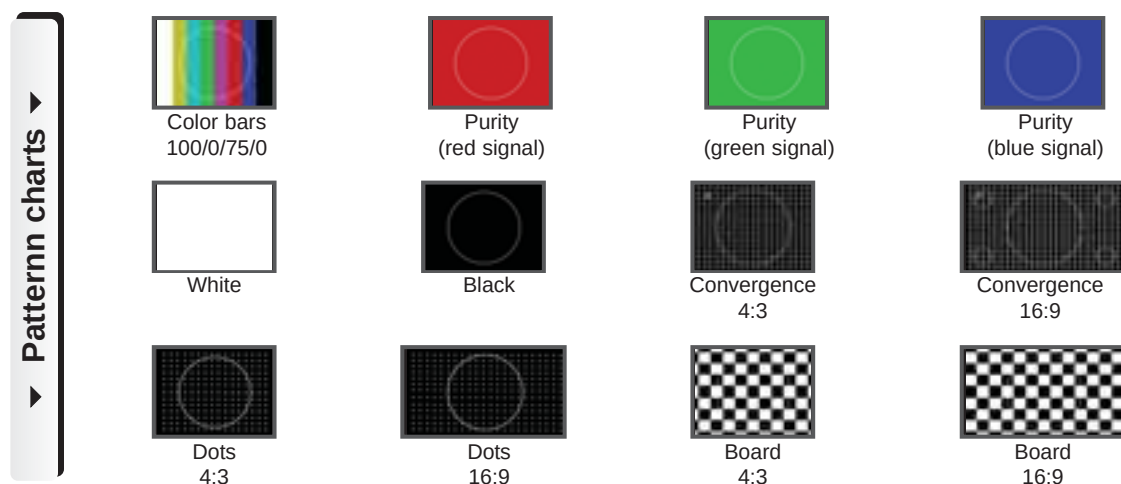
Electronic circle

Pattern icons
on the front panel

▼ Outputs ▼

RF
RGB
S-VHS
SCART
Synchronisms
Composite video

Economy range



SPECIFICATIONS	GV - 198	Composite video output	
System & Standard	PAL B/G/D/K/I/M/N, SECAM B/G/D/K/L, NTSC M	Amplitude Connector	1 Vpp, negative polarity BNC and SCART, 75 Ω impedance
Video modulation	AM double side band	RGB output (SCART)	
Sound modulation		Amplitude Connector	0.7 Vpp SCART, 75 Ω impedance
Type	Mono multistandard	Composite sync. output	
Carrier	Seleccionable ON/OFF	Signal	Vertical + Horizontal
Carrier frequency	From 4.5 to 6.5 MHz	Amplitude	2.5 Vpp
Modulation type	FM / AM (1 kHz)	Connector	BNC, 1 k Ω impedance
PAL color subcarrier		Low frequency output (SCART)	
Frequency	3.5756118 to 4.43361875 MHz $\leq \pm 30$ ppm	Frequency	1 kHz, amplitude 500 mVpp
Burst duration	2.4 μ s (10 ± 1 Fsc period)	Connector	SCART, 10 k Ω impedance
Burst position	5.6 μ s + 100 ns from the line previous synchronism flank	RF output	
Amplitude error	$\pm 5\%$	Range	De 37 a 865 MHz (sinthesized)
NTSC		Output amplitude	85 dB μ V ± 3 dB
Frequency	3.579545 MHz $\leq \pm 30$ ppm	Power supply	
Burst duration	2.38 μ s (10 ± 1 Fsc period)	Mains supply	110-125-220-230/240 V AC $\pm 10\%$, 50-60 Hz
Burst position	5,56 μ s + 100 ns from the line previous synchronism flank	Consumption	15 W
Amplitude error	$\pm 5\%$	Mechanical features	
SECAM		Dimensions	W. 212 x H. 102 x D. 241 mm
Subcarrier frequency	4.250000 to 4.406250 MHz ± 2 kHz	Weight	1.78 kg.
Chroma signal amplitude	D'r -1.5 to -1.9		
Chroma pre-correction	Bell filter		

Multimedia signal generator



- DVI Output
- Available tests for PAL, NTSC and HDTV systems
- Computer monitors VESA test
- Customized video formats
- Automatic detection of monitor supported formats
- Customized test sequences
- Electronic circle for geometry adjustments
- PC software included

The **GV-242** multimedia signal generator is an accurate, handy instrument; it provides signals, reference patterns and sound to support the verification of all kinds of computer monitors, video projectors, TV sets, flat screens (TFT & plasma) or multimedia monitors.

Its many features, like small size and battery operation, turn it into a very convenient instrument for both lab use and travelling service technicians. The **GV-242** is a portable, handy unit.

It features advanced characteristics, like self-calibration, colour sensors compatibility and customized test sequences; it also supports the design of customized video formats using *Video Generator Manager*, a PC application for MS Windows based computers .

Includes an RS-232 port, supporting PC-controlled operation and firmware updates.

▼ 20 Charts ▼

4:3 and 16:9 formats

Electronic circle

For TV sets
and monitors

Customized formats

▼ Outputs ▼

YPbPr

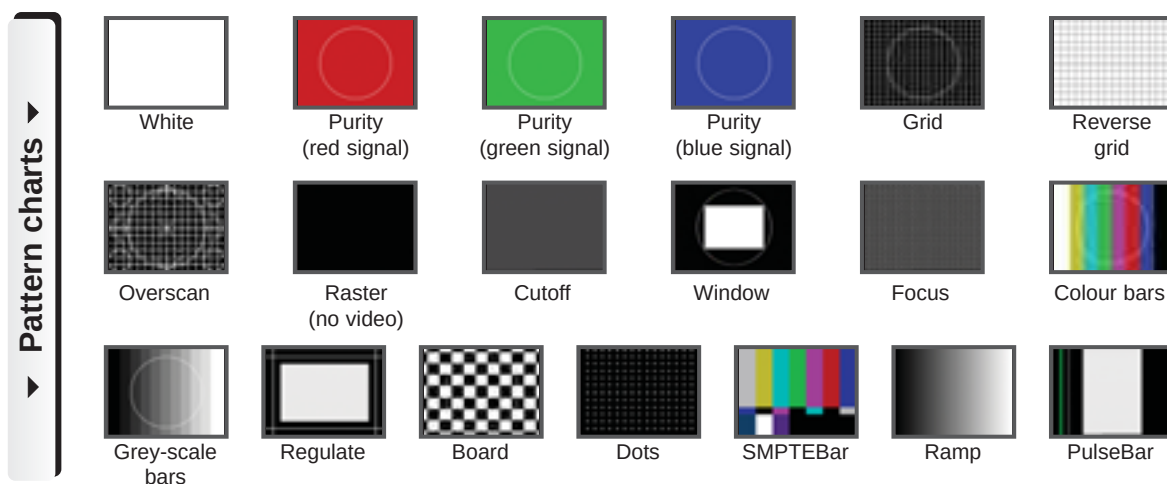
RGB

S-VHS

DVI

VESA

Supports high definition formats



Using an optional accessory (colour sensor), the **GV-242** can measure chromaticity (expressed as x,y coordinates according to the CIE standard) and screen brightness, that can be expressed in "fL" or "nits".

SPECIFICATIONS	GV - 242	User Interface	20 x 4 character LCD with backlight Intuitive drill-down menus
Formats Storage Built-in Edit method	126 total VESA, DVI, PAL/NTSC, HDTV/SDTV-RGB, HDTV/SDTV-YPbPr MS Windows based <i>Video Generator Manager</i>	Display Controls	
Images Standard	White, Purity (red, green, blue), Grid, Reverse grid, Overscan, Raster, Cutoff, Focus, Colour bars, Grey-scale bars, Regulate, Checker, Dots, SMPTEBar, Ramp, Pulse Bar	Computer Port Type Purpose	RS-232C, 9 pin Copy formats and firmware updates from PC
Test sequence Storage Edit method Parameters	100 steps Using <i>Video Generator Manager</i> Format, image, duration (0.1 seg to 24 hours)	Color sensor support Description	Display data from a color sensor for white balance adjustment
Horizontal Timing Frequency Total pixels Active range	1.5 kHz - 250 kHz 32 to 4095 16 to 4294 pixels	DDC (Display Data Channel) Description Version	Read a monitor's EDID data and display the manufacturer's supported formats DDC-2B (read only)
Vertical Timing Frequency Active lines Sync types Scan types	1 Hz - 1 kHz 1 - 4095 Separate, digital/analog composite Progressive, Interlace, HDTV	Sound Output Signal	Stereo connector, 3.5 mm Tone 1 kHz (left), Tone 2 kHz (right)
		Power supply DC Battery life AC Charge time Frequency Voltage	6 AA NiMh batteries included 8 hours between charges with NiMh Charger / generator power supply 8 hours 50 to 50 Hz 100 - 250 VAC (auto-select)
		Mechanical features Dimensions Weight	W. 210 x H. 152 x D. 41 mm. 700 g

Test generator for monitors



▼ 8 pattern charts ▼

Colour bars
Purity (Red, Green, Blue)
Gray-scale bars
Crosshatch
Multiburst
White 100%

▼ Outputs ▼

2 x D9
D15
RGB
Composite sync.
Horizontal sync.
Vertical sync.
Video without sync.

SPECIFICATIONS	GV - 241		
RGB outputs Output Amplitude Impedance	R Red signals	B Blue signals	G Green signals with/without sync.
	0.7 Vpp		
	75 Ω, BNC connector		
CVS Output Output Amplitude Impedance	Video signal 0.7 Vpp 75 Ω, BNC connector		
Synchronism Output Output Señal	HS Horizontal Sync.	VS Vertical Sync.	CS Sync. Composite
	TTL, BNC connector		
	Connectors D9, D15 miniature and D15 respectively. Direct connection to the monitor. The outputs of the D9 connector are all TTL. When the "Color bars" or "Gray-scale bars" are selected, a B/W picture will appear. When used with a Hercules monitor, the R, G and B charts will be black.		
CVS Output Output Impedance	Video signal 75 Ω, BNC connector		
Power supply Mains supply Consumption	AC 110-125-220-230-240 V ± 10%, 50-60 Hz 9 W		
Mechanical features Dimensions Weight	W. 212 x H. 102 x D. 241 mm 2.4 kg.		

The wide range of different models in the computer monitor field drives demand for versatile instruments like the **GV-241**, a universal generator for checking monitors that greatly simplifies their adjustment, verification and repair.

The **GV-241** provides up to 29 possible graphic systems; signals are highly reliable in regard to sync, line and field timing. It supports three monitor connector types, as well as RGB, CVS outputs; horizontal, vertical and composite sync are through BNC connectors.

Supports a wide range of monitors

First group (P)

System	Pixels	Frequency		PAH (4) (ms)	SH (2) (ms)	PPH (3) (ms)	PAV (8) (ms)	SV (6) (ms)	PPV (7) (ms)	Polarity		Interlace
		Horiz (kHz) (1) ⁻¹	Vert (Hz) (5) ⁻¹							H	V	
VGA	640x480	31.469	59.94	0.636	3.813	1.907	0.318	0.064	1.048	-	-	NO
VESA	800x600	37.879	60.317	1	3.2	2.2	0.026	0.106	0.607	+	+	NO
VESA	1024x768	48.363	60.004	0.369	2.092	2.462	0.062	0.124	0.6	-	-	NO
ATT	1280X1024	63.953	59.938	0.727	1.018	2.255	0.016	0.078	0.579	-	-	NO
Sun	1600X1280	89.2	66.9	0.001	2.03	1.4	0.011	0.112	0.471	+	+	

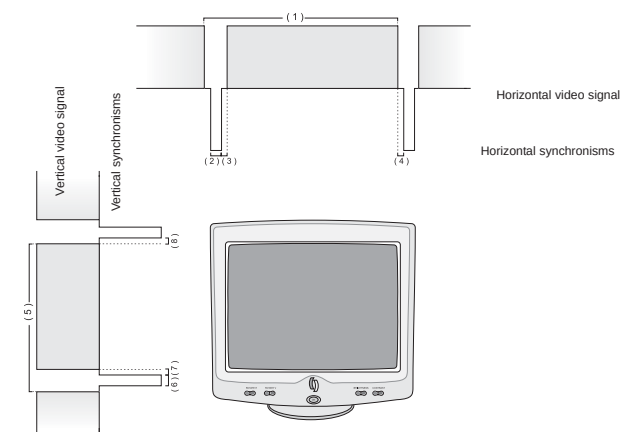
TOLERANCE

Horizontal frequency shift	± 1 %
Vertical frequency shift	± 1,5 %

Second group (S)

System	Pixels	Frequency		PAH (4) (ms)	SH (2) (ms)	PPH (3) (ms)	PAV (8) (ms)	SV (6) (ms)	PPV (7) (ms)	Polarity		Interlace
		Horiz (kHz) (1) ⁻¹	Vert (Hz) (5) ⁻¹							H	V	
CGA, EGA	640x200	15.81	61.5	6.6	4.2	7.2	1.58	0.19	2.15	+	+	NO
MDA, Hercules	720X350	18.42	49.91	0.6	8.25	1.45	0.001	0.9	0.2	+	-	NO
EGA Hi	640X350	21.86	59.72	0.001	4.9	1.6	0.001	0.6	0.08	+	+	NO
VGA	640X350	31.469	70.09	0.636	3.813	1.907	1.176	0.064	1.902	+	-	NO
VGA	640X400	31.469	70.09	0.636	3.813	1.907	0.318	0.064	1.112	-	+	NO
VGA Text	720X400	31.48	70.11	0.635	3.812	1.906	0.304	0.063	1.111	-	+	NO
VESA	720X400	37.736	90.044	0.75	1.25	4.5	0.239	0.08	0.981	-	+	
MAC II	840X480	35	66.67	2.116	2.116	3.175	0.084	0.086	1.114	+	+	NO
VESA	800X600	35.156	56.25	0.667	2	3.556	0.028	0.057	0.626	+/-	+/-	
VESA	640X480	37.86	72.809	0.762	1.27	4.603	0.238	0.079	0.74	-	-	
8514	1024X768	35.522	86.96	0.178	3.92	1.247	0.014	0.112	0.563	+	+	YES
SVGA 72Kc	800X600	48.09	72.01	1.121	2.399	1.279	0.479	0.124	0.774	+	+	
1025x768	1025X768	48.3	60	0.369	2.092	2.462	0.062	0.124	0.6	-	-	NO
SONY Std1	1024X768	48.78	60	1	1.5	2	0.061	0.061	0.799	+	+	NO
DEC	1024X864	54	60	0.16	1.85	1.68	0.001	0.056	0.629	+	+	
XGA	1024X768	56.5	70	0.32	1.813	1.92	0.053	0.106	0.513	-	-	NO
57K/72H	1024X768	57.09	72	0.32	1.77	1.87	0.054	0.103	0.5	+	+	
Radius	1152X882	66	72	0.138	1.28	2.42	0.001	0.2	0.38	+	+	
MAC II TP	1152X870	68.681	75.06	0.32	1.28	1.44	0.043	0.043	0.567	-	-	NO
Samsung	1006X1048	62.8	59.8	0.15	1.88	1.58	0.001	0.127	0.542	+	+	
SONY Std 2	1280X1024	63.337	59.98	0.407	1.701	1.849	0.047	0.047	0.41	+	+	NO
DEC	1280X1024	70.7	66.5	0.267	1.33	1.87	0.042	0.042	0.467	+	+	
Arts. Graf	1280X1024	78	73	0.228	0.915	1.907	0.038	0.038	0.488	+	+	

- PAH (4) Horizontal front porch time
- SH (2) Horizontal synchronism
- PPH (3) Horizontal back porch time
- PAV(8) Vertical front porch time
- SV (6) Vertical synchronism
- PPV (7) Vertical back porch time





TEST AND
MEASUREMENT



TELECOMMUNICATIONS
TEST EQUIPMENT



OPTICAL
TEST EQUIPMENT



ELECTRONIC
TRAINING EQUIPMENT